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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,144	06/26/2001	Robert J. Schroeder	60.1413	2201

7590 07/30/2003

Intellectual Property Department
Schlumberger-Doll Research
Old Quarry Rd.
Ridgefield, CT 06877

EXAMINER

VALENCIA, DANIEL E

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/892,144

Applicant(s)

SCHROEDER, ROBERT J.

Examiner

Daniel E Valencia DV

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's Appeal Brief filed on June 4, 2003 has been carefully studied by the Examiner. The arguments advanced therein are persuasive and the rejections based upon prior art made of record in the previous Office Action are withdrawn. The finality of the previous Office Action has also been withdrawn and the PROSECUTION IS HEREBY REOPENED. However; during the course of the extensive study period a new especially relevant reference came to the attention of the Examiner. In view of the newly discovered reference a new **non-final** rejection is made.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Quigley U.S. Patent Application Publication No. 2002/0119271 A1. Refer to the appropriate drawings or parts of the specification. Quigley discloses a composite spoolable tube with sensor that discloses all the limitations of the abovementioned claims. Regarding claim 1, Quigley discloses a sensor telemetry system ("Summary of Invention" and

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figures 21-23) comprising: at least one optical sensor (paragraph 22, line 4); at least one non-optical sensor; an optical fiber coupled (paragraph 28, lines 3 and 4) with the optical sensor and the non-optical sensor and being arranged to carry signals outputted from the optical sensor and the non-optical sensor. Quigley further discloses that the optical sensor is an intrinsic fiber optic sensor (paragraph 21, line 3), more specifically a Bragg grating (paragraph 23, line 6), as explained in claims 2 and 3. As to claim 4, Quigley discloses that the optical sensor comprises one of the sensor types enumerated in the claim (paragraph 22). Quigley further discloses that the non-optical sensor comprises one of the sensor types enumerated in claim 5 (paragraphs 22 and 24).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quigley. Refer to the appropriate drawings or parts of the specification. Quigley as applied above, discloses essentially all the limitations of the claimed invention. Quigley discloses a detector (fig. 22, 100) coupled to the optical fiber (70) at the surface of the oilfield, which is further coupled to an optoelectronic device (fig. 23, 86) and wherein a source (98) is optically coupled (96) to the fiber, as described in claims 9-11, 18, and 19. Regarding part of claim 12, as well as claim 13, Quigley discloses that the telemetry

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system is used as an oilfield monitoring system (paragraph 14) deployed in an oilfield, wherein the borehole (fig. 20) traverses the oilfield. However, the reference does not explicitly disclose a converter coupled to the non-optical sensor.

On the other hand, one of ordinary skill in the art would recognize that in order for a non-optical sensor to be coupled to an optical fiber properly, the non-optical signal would necessarily be converted into an optical signal for transmission on the optical medium. In addition, electro-optic conversion devices (such as piezoelectric elements disclosed in the reference) are the most well known types of converters. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a converter to couple the non-optical sensors to the optical fibers, as explained in claims 6, 7, 17, and 24.

Additionally, because the non-optical sensors would need to be coupled by a conversion element to the optical fiber, they would be located remotely from the optical fiber, as an inherent property of being coupled through the conversion element, as mentioned by claims 14 and 15.

With reference to claims 8 and 16, using a Bragg grating encircled by a coating (such as piezoelectric coating, see paragraph 71), is a well-known means of converting mechanical strain in a non-optical sensor to an optical signal for transmission. As to claims 25 and 27, Quigley's Bragg grating sensor(s) functions by modifying the source wavelength(s) according to the applied strain(s) (paragraph 159 and 160). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use

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a Bragg grating and a coating (such as a piezoelectric element) as a means of converting the non-optical signal.

Although, the reference does not explicitly state that the first and second optical signal are demodulated, as mentioned in claim 20, Quigley shows a signal processing unit at the surface of the oil field for receiving the optical signals (fig. 23, 86). In order to derive the geophysical information from the optical signal, the signal-processing unit would have demodulate and/or demultiplex the two sets of optical signals from the optical and non-optical sensors (claim 26). Additionally, wavelength, frequency, and time division multiplexing (claims 21-23) are well known means for modulating information onto an optical signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention that the device disclosed by Quigley would need to demodulated the optical signal, in the time, frequency, or wavelength domain, in order to derive information about the physical parameters being sensed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel E Valencia whose telephone number is (703)-305-4399. The examiner can normally be reached on Monday-Friday 9:30-6:00.

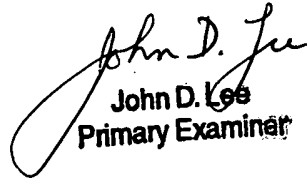
The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7724 for regular communications and (703)-308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.



DEV
July 11, 2003



John D. Lee
Primary Examiner